1. (Currently Amended) A dimensionally stable polymer balloon having a longitudinal axis and composed of a micro-composite material, the micro-composite material comprising a polymer matrix component and a polymer fibril component distributed in the polymer matrix component, the fibril component having micro-fibers oriented substantially parallel or diagonally to the longitudinal axis of the balloon, the polymer matrix component comprising at least one material selected from the group consisting of phthalate and naphthalate polyesters; polyamides; polyamide elastomers; polyester elastomers; polyurethane elastomers; acetal homopolymers and copolymers; cellulosic polymers; poly(chlorotrifluoroethylene); poly(vinylidine fluoride); nylons; polyoxymethylene; poly(methyl methacrylate); polypropylene homopolymers and copolymers; polycarbonates and poly(ethylene-vinyl alcohol).

2. (Original) The dimensionally stable polymer balloon of claim 1 mounted on a catheter.

3. (Original) The dimensionally stable polymer balloon of claim 1, wherein said micro-composite material comprises about 0.1 wt-% to about 20 wt-% of said fibril component.

4. (Original) The dimensionally stable polymer balloon of claim 1, wherein said micro-composite material comprises about 0.5 wt-% to about 8 wt-% of said fibril component.

5. (Original) The dimensionally stable polymer balloon of claim 1, wherein said micro-composite material comprises about 0.5 wt-% to about 15 wt-% of said fibril component.

6. (Original) The dimensionally stable balloon of claim 1, wherein said micro-composite material comprises about 50 wt-% to about 99.9 wt-% of said polymer matrix component.

7. (Original) The dimensionally stable balloon of claim 1, wherein said micro-composite material comprises about 85 wt-% to about 99.5 wt-% of said polymer matrix component.

8. (Original) The dimensionally stable balloon of claim 1, wherein the micro-composite material further comprises a compatibilizer component.

9. (Original) The dimensionally stable balloon of claim 8 wherein said compatibilizer is a block copolymer.

10. (Original) The dimensionally stable balloon of Claim 8 wherein said compatibilizer is selected from the group consisting of copolyester elastomers, ethylene unsaturated ester copolymers, copolymers of ethylene and a carboxylic acid or derivative thereof, polyolefins or ethylene-unsaturated ester copolymers grafted with functional monomers,

copolymers of ethylene and a carboxylic acid or derivative thereof, terpolymers of ethylene, copolymers of unsaturated esters and carboxylic acids or derivatives thereof, maleic acid grafted styrene/ethylene-butadiene-styrene block copolymers, acrylic elastomers, glycidyl(meth)acrylates, ionomeric copolymers, polyester-polyether block copolymers, and mixtures thereof.

11. (Original) The dimensionally stable polymer balloon of claim 1, wherein said compatibilizer is selected from the group consisting of ethylene-maleic anhydride copolymers, ethylene-methyl acrylate copolymers, ethylene-methyl acrylate-maleic anhydride terpolymers, ethylene- methyl acrylate-methacrylic acid terpolymers, alkyl(meth)acrylate-ethylene-glycidyl(meth)acrylate terpolymers, and mixtures thereof.

12. (Original) The dimensionally stable balloon of claim 1, wherein the fibril component is composed of rigid-rod thermoplastic material.

13. (Original) The dimensionally stable balloon of claim 1, wherein the fibril component is composed of semi-rigid-rod thermoplastic material.

14. (Original) The dimensionally stable balloon of claim 1, wherein the fibril component is composed of liquid crystal polymer material.

15. (Original) The dimensionally stable balloon of claim 1, wherein the fibril component has a melting point of about 275° C or less.

16. (Original) The dimensionally stable balloon of claim 1, wherein the fibril component has a melting point of about 250° C or less.

17. (Original) The dimensionally stable balloon of claim 1, wherein the fibril component has a melting point of about 150° to about 249° C.

18. (Original) The dimensionally stable balloon of claim 1, wherein the fibril component has a melting point of about 230° C or less.

19. (Original) The dimensionally stable balloon of claim 1, wherein the matrix component comprises a semi-compliant thermoplastic polymer.

20. (Original) The dimensionally stable balloon of claim 1, wherein the matrix component has a melting point of about 140° C to about 265° C.

21. (Original) The dimensionally stable polymer balloon of claim 1, wherein the matrix component comprises a polyamide-polyester block copolymer, a

polyamide/polyether/polyester block copolymer, a polyester-polyether block copolymer, or a mixture thereof.

22. (Original) The dimensionally stable polymer balloon of claim 1, wherein the matrix component has a melting point of about 150° C to about 230° C.

23. (Original) The dimensionally stable polymer balloon of claim 1, wherein the matrix component has a melting point of about 220° or less.

24. (Original) The dimensionally stable balloon of claim 1, wherein the micro-fibers are oriented substantially parallel to the longitudinal axis of the balloon.

25. (Original) The dimensionally stable balloon of claim 1, wherein the micro-fibers are oriented diagonally to the longitudinal axis of the balloon.

26. (Previously Presented) The dimensionally stable balloon of claim 1, wherein the orientation of the micro-fibers relative to the longitudinal axis of the balloon changes through the balloon material in a direction transverse to said longitudinal axis.

27-30. (Canceled)

31. (Previously Presented) An inflatable medical balloon having a circumference and a longitudinal axis comprising:

a matrix material, said matrix material characterized as being semi-compliant; and having a plurality of individual fiber cores mixed therethrough, said cores being evenly distributed about the circumference of the balloon and being composed of one or more materials which are characterized as being stronger than the matrix material and having a bulk elongation less than the matrix material when the one or more materials are oriented in the direction of the longitudinal axis, and the matrix material and the core material operatively adhering to one another.

32. (Canceled)

33. (Original) The medical balloon of claim 31, wherein the balloon longitudinally expands less than 5% beyond the pre-inflation state.

34-35. (Canceled)

36. (Original) The medical balloon of claim 31, wherein the balloon has a multilayer structure.